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TECHNICAL REPORT 2004-008

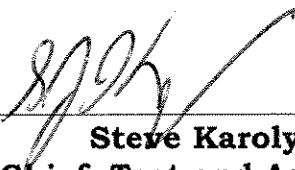
**Joint Single Integrated Air Picture
System Engineering Organization (JSSEO)
Standard Test Plan Template**

DECEMBER 2004

**Joint Single Integrated Air Picture
System Engineering Organization (JSSEO)**


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STANDARD TEST PLAN TEMPLATE

Joint Single Integrated Air Picture (SIAP)
System Engineering Organization (JSSEO)
Name of Event
Test Plan

Approved by:

Note: The Director, JSSEO, or a designated representative, will be the approval authority for all test plans to ensure leadership concurs with the test plan. Additional approval signatories will be established as appropriate based on the scope, complexity, level of visibility, and participants in the test event.

JSSEO

Name of Primary Point of Contact



Date

Approval Agency (e.g., JTAMDO, JFCOM)

Name of Primary Point of Contact

Date

Approval Agency (e.g., JITC)

Name of Primary Point of Contact

Date

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STANDARD TEST PLAN TEMPLATE

**Joint Single Integrated Air Picture (SIAP)
System Engineering Organization (JSSEO)**

**Name of Event
Test Plan**

Submitted By:

Test Director

Date

Name of Test Director (Organization) (M&S venues)

Reviewed By:

Normally the SIAP Analysis Team Executive Steering Group (SAT ESG) will review the Test Plan. Additionally, a cognizant representative from each participating organization shall review the Test Plan. Signature by the reviewer indicates that his organization agrees to its role in the test event as described in the Test Plan.

Reviewal Agency (e.g., E-2C)

Date

Name of Primary Point of Contact

Reviewal Agency (e.g., E-2C)

Date

Name of Primary Point of Contact



SAT ESG Co-Chair (JSSEO)

Date

Name of Co-Chair

SAT ESG Co-Chair (USJFCOM)

Date

Name of Co-Chair

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EXECUTIVE SUMMARY

This document is a template for a Test Plan that is applicable to Joint Single Integrated Air Picture (SIAP) System Engineering Organization (JSSEO) Test Events. In the conduct of live events, Hardware-in-the-loop (HWIL) simulation-driven exercises, or constructive models and simulation analysis, data will be collected to support JSSEO objectives. The main purpose of a test plan is to ensure that the objectives have been clearly defined and that the correct data will be collected to support these JSSEO objectives, experiments, and follow-on analyses.

The planning documentation for a particular test will include 1) the Test Plan outlined in this template and, 2) a Test Readiness Report, which is outlined in the Standard Test Readiness Report Template TR 2004-016. The Test Plan establishes the test objectives, organizational and individual roles and responsibilities, and schedule to secure all resources and assets required to conduct the test. The Test Readiness Report is an update to the Test Plan and ensures that all steps necessary to commence the test event are complete. The Test Readiness Report is presented to the designated approval authorities at the Test Readiness Review with Go/No-Go criteria established for determining readiness. Approval authority signature on the Test Readiness Report indicates agreement with the report and authorization to conduct the test.

The test planning process includes

1. Identifying the test objectives
2. Ensuring that the necessary operational conditions are met
3. Describing the roles and responsibilities
4. Describing the Verification, Validation, and Accreditation efforts for simulations
5. Planning post-event analysis
6. Developing a schedule for planning, executing, analysis and reporting.

This template attempts to address all types of tests envisioned. However, certain sections are not applicable to all types of tests, so this template should be tailored depending on the type of event.

In the Executive Summary of the Test Plan, provide a summary of essential information regarding the testing/simulation event. Include high-level objectives, dates and location of the event and how the results will be used.

STYLE AND FORMATTING GUIDELINES

This test plan template has specific style types built into it to allow common formatting across test plans. Headings are defined as first order, second order, third order, and so on; or, as number one, number two, and number three. There should seldom be a number four heading. These heading styles are called "Heading 1, Head 1," "Heading 2, Head 2," "Heading 3, Head 3," and "Heading 4, Head 4." They are of Bookman Old Style font, are boldface, and not underlined. Numbering goes as 1., 1.1, 1.1.1, etc.

Figure captions use the style "Caption." Table titles use the style "Table Center." Appendix titles use the style "Annex."

Updating Table of Contents, List of Figures, List of Tables, and List of Appendices is done using the following steps:

- a) Identify the table or list you wish to update and right-click inside it.
- b) Select "Update field."
- c) If you want to update the table headers AND pages numbers, select "Update entire table." If you want to just update page numbers, select "Update page numbers only."

In accordance with the JSSEO configuration management policy, the footer of the document should have the following format:

WBS number_Test Plan (Document Control Number)_Version
Number_JSSEO_YYMMDD

TABLE OF CONTENTS

EXECUTIVE SUMMARY	ix
STYLE AND FORMATTING GUIDELINES	x
1. INTRODUCTION	1-1
1.1 Background	1-1
1.2 Purpose of Test	1-1
1.3 Scope of Test	1-1
2. OVERALL TEST DESIGN	2-1
2.1 Concept of Test Operations	2-1
2.2 Brief Experiment Description	2-1
2.2.1 Experiment Objectives	2-1
2.2.2 Experiment Hypothesis	2-1
2.2.3 Attributes and MOPs Measured	2-1
2.2.4 Data Management and Success Criteria	2-1
2.2.5 Test Methodology	2-2
2.2.5.1 Baseline Experiment	2-2
2.2.6 Requisites	2-2
2.2.7 Data Reduction and Analysis Method	2-2
2.2.8 Analysis Team	2-2
2.2.9 Reporting Schedule	2-2
2.3 Additional Experiments	2-3
3. MODELING AND SIMULATION (M&S Venues)	3-1
3.1 Federation Design	3-1
3.2 Federate Roles	3-1
3.2.1 Federate Name (e.g., E-2C Federate, ESTEL)	3-1
3.2.2 Support Federates	3-2
3.2.3 Supporting Tools	3-2
3.3 M&S Verification, Validation, and Accreditation (VV&A) Process	3-3
4. TEST SCHEDULE	4-1
5. TEST MANAGEMENT AND ORGANIZATION	5-1
5.1 Roles and Responsibilities	5-1
5.1.1 Customer (e.g., JSSEO)	5-1
5.1.2 Test Sponsor Name (e.g., Joint Theater Air and Missile Defense Organization, JTAMDO)	5-2
5.1.3 Application Area Manager (e.g., Joint National Integration Center, JNIC) (M&S Venues)	5-2
5.1.4 Infrastructure/Technical Manager (e.g., Joint Interoperability Test Command (JITC)) (M&S Venues)	5-2
5.1.5 Participating Service(s) (e.g., Lower Tier Project Office/ Software Engineering Directorate (LTPO/SED))	5-3

UNCLASSIFIED

5.1.6 Supporting Agencies (e.g., Naval Surface Warfare Center (NSWC) Corona).....	5-3
5.1.7 SIAP Analysis Team (SAT): Executive Steering Group (ESG) and Other Test Representatives.....	5-3
5.1.8 SIAP Common Reference Scenarios (CRS) Team.....	5-4
5.2 On-site Organization.....	5-4
6. REPORTING.....	6-1
6.1 Test Readiness Report.....	6-1
6.2 Quick-Look Report.....	6-1
6.3 Technical Report Development.....	6-1
7. REFERENCES.....	7-1

LIST OF FIGURES

Figure 1. Notional Federation Design.....	3-1
Figure 2. JSSEO VV&A Process.....	3-4
Figure 3. Notional Schedule	4-1
Figure 4. Notional Organization of an M&S Event.....	5-1
Figure C-1. Federation development and execution process.....	C-1

LIST OF TABLES

Table 1. Federates Requiring V&V Plan	3-5
Table 2. V&V Schedule	3-5
Table 3. Reporting Timeline Requirements.....	6-2
Table D-1. Participants in the JDEP Planning.....	D-1
Table D-2. Test Directors/Site Test Directors.....	D-1
Table D-3. Data Collection Team	D-1
Table D-4. Site Leads/POCs	D-1
Table D-5. Lead Analysts.....	D-2

LIST OF APPENDICES

APPENDIX A: ACRONYMS	A-1
APPENDIX B: SIAP METRICS	B-1
APPENDIX C: FEDERATION DEVELOPMENT PROCESS (M&S VENUES)	C-1
APPENDIX D: POINTS OF CONTACT	D-1

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1. INTRODUCTION

1.1 Background

Discuss the significant events, developments, findings, and/or management decisions that led to this test being conducted. Reference should be made to previous related tests, problems found during operational use, significant historical data, major focus areas, and capabilities of the testing/simulation process, as appropriate. Include topics such as:

1. Dates of Significant Milestones
2. Origin
3. Process
4. Timeframe and Priorities
5. Location
6. Environment

1.2 Purpose of Test

Succinctly state the top-level purpose of the test. Identify the customer for the test results. Describe the final product of the test (i.e., the deliverable) and how the customer will use it.

1.3 Scope of Test

Identify the top-level test objectives, hypotheses, test description, and instrumentation. Identify the participating organizations, test elements, and assessment constraints and limitations.

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2. OVERALL TEST DESIGN

2.1 Concept of Test Operations

Describe the general test approach along with the specific methodologies and techniques used by the test team to plan, organize, and manage the testing activity. The test design should perform the following functions:

1. Structure and organize the approach to testing in terms of specific test objectives;
2. Identify key measures of performance (MOPs);
3. Identify the required data and demonstrate how the data will be gathered, stored, analyzed, and used;
4. Indicate what part modeling and simulation will play in meeting test objectives;
5. Identify the number and type of test events and required resources.

2.2 Brief Experiment Description

Specify the test objectives, events, and analysis requirements.

2.2.1 Experiment Objectives

Identify objectives; include any sub-objectives.

2.2.2 Experiment Hypothesis

Identify the hypothesis for the experiment that is to be proved or disproved.

2.2.3 Attributes and MOPs Measured

Briefly describe the parameters or outputs that will be used to evaluate system performance. MOPs should be short definitive statements beginning with an action verb (e.g., "measure" or "calculate").

2.2.4 Data Management and Success Criteria

Summarize data and instrumentation requirements and data management strategy. A detailed Data Management and Analysis Plan will be provided as an appendix to the Test Readiness Report.

For the data requirements listed, identify a process for determining that data has been properly collected. (Did the test go as planned? Was data collection successful? Is data quality sufficient for post-event analysis? Is more

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or supplemental data needed? EOIs identified and packaged for analysis? TORs collected? Media/tapes set for next operation?) .

2.2.5 Test Methodology

Describe test methodology and procedures to safely and efficiently acquire the appropriate information to correctly calculate the MOP.

2.2.5.1 Baseline Experiment

Describe how a baseline for Critical Experiments will be established.

For example: "The first set of runs will support establishing a baseline for the E-2C SIAP performance. Two runs will be taken to ensure that the data between the two runs produces similar SIAP results and that the process is repeatable. SIAP attributes will be calculated for these runs and will be used as the standard bearer against which all parametric analysis will be compared. It is expected that both operator/analyst observations and the SIAP attributes will reflect a minimum of differences between the two runs. If repeatable baseline runs are not achieved, parametric runs will not be conducted until the cause for lack of repeatability is determined and fixed."

2.2.6 Requisites

Identify the operational context required to properly collect the data for the experiment. Include number and types of units required. Identify Go/No-Go criteria for conducting the event. For Models and Simulations, identify specific modeling capabilities that are essential to meeting test objectives.

2.2.7 Data Reduction and Analysis Method

Identify the data reduction process, including tools used, how the data will be used and by whom, and how the data will be provided to analysis team. Describe the analysis method, including description of tools/algorithms for conducting analysis.

2.2.8 Analysis Team

List the analysis team lead and key team members. Include their roles in the event and contact information.

2.2.9 Reporting Schedule

Include the schedule for conducting the analysis, and identify any constraints or contingencies on delivering the report.

2.3 Additional Experiments

If the test includes multiple experiments, describe the first critical experiment in section 2.2, then add sections 2.3, 2.4,..., 2.n as necessary for each of n critical experiments. Follow the format of section 2.2 for these additional sections.

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3. MODELING AND SIMULATION (M&S Venues)

3.1 Federation Design

Include an overview of the components, interfaces, systems' roles in the federation, how they are implemented, and any support elements (Figure 1). List each federate and document further detail for each. A more detailed discussion of federation development should be provided in a separate appendix to the Test Readiness Report.

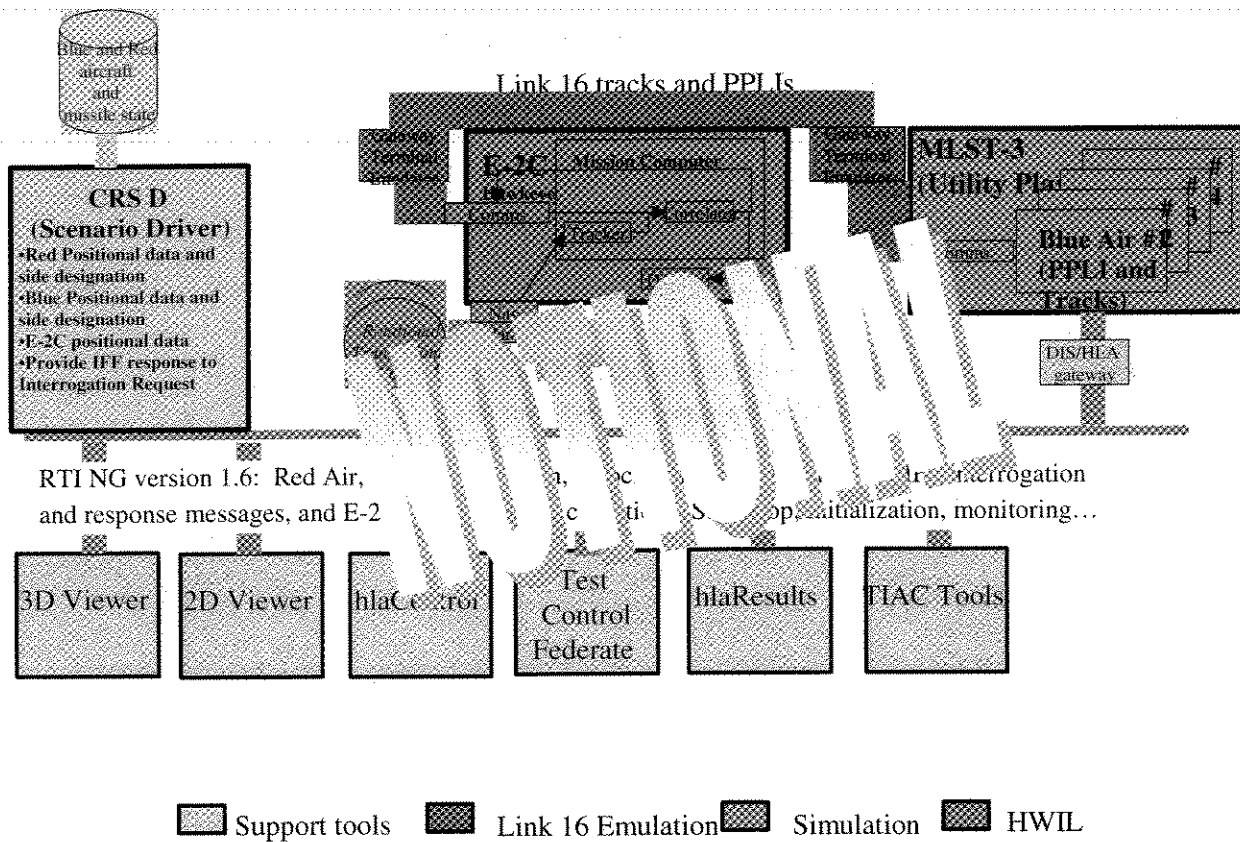


Figure 1. Notional Federation Design

3.2 Federate Roles

3.2.1 Federate Name (e.g., E-2C Federate, ESTEL)

Provide a functional description of the Federates that will be used during the event.

Role in Federation:

- State federate's role(s) in the federation.

- For example: Simulates E-2C APS-145 radar, IFF interrogator/transponder, and navigational systems.

Constraints/Limitations

- State federate's constraints/limitations.

Implementation:

- State federate's implementation.
- For example: AN/APS-145 Radar is simulated using RISS.

Federation Verification, Validation, and Accreditation (VV&A):

- State pertinent VV&A information.

3.2.2 Support Federates

Identify and describe support federates required for the event. For example:

Test Control

- Adapted from Navy Infrastructure (NI) effort.
- Provides federation start/stop and monitoring.

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- Commercial product to collect data in federation and play back data.

3.2.3 Supporting Tools

Identify and describe supporting tools that are required for the event. For example:

Command, Control, Communication, and Intelligence (C3I) Engineering and Evaluation System (CEES)

- Interoperability tool developed by Redondo Systems, Inc.
- Monitors and collects TADIL J and DIS truth data.

Joint Analysis Display Environment (JADE)

- Three-dimensional quick-look tool during runs.
- Monitors and collects TADIL J and HLA truth data.
- Post-mission three dimensional (3D) replay capability.

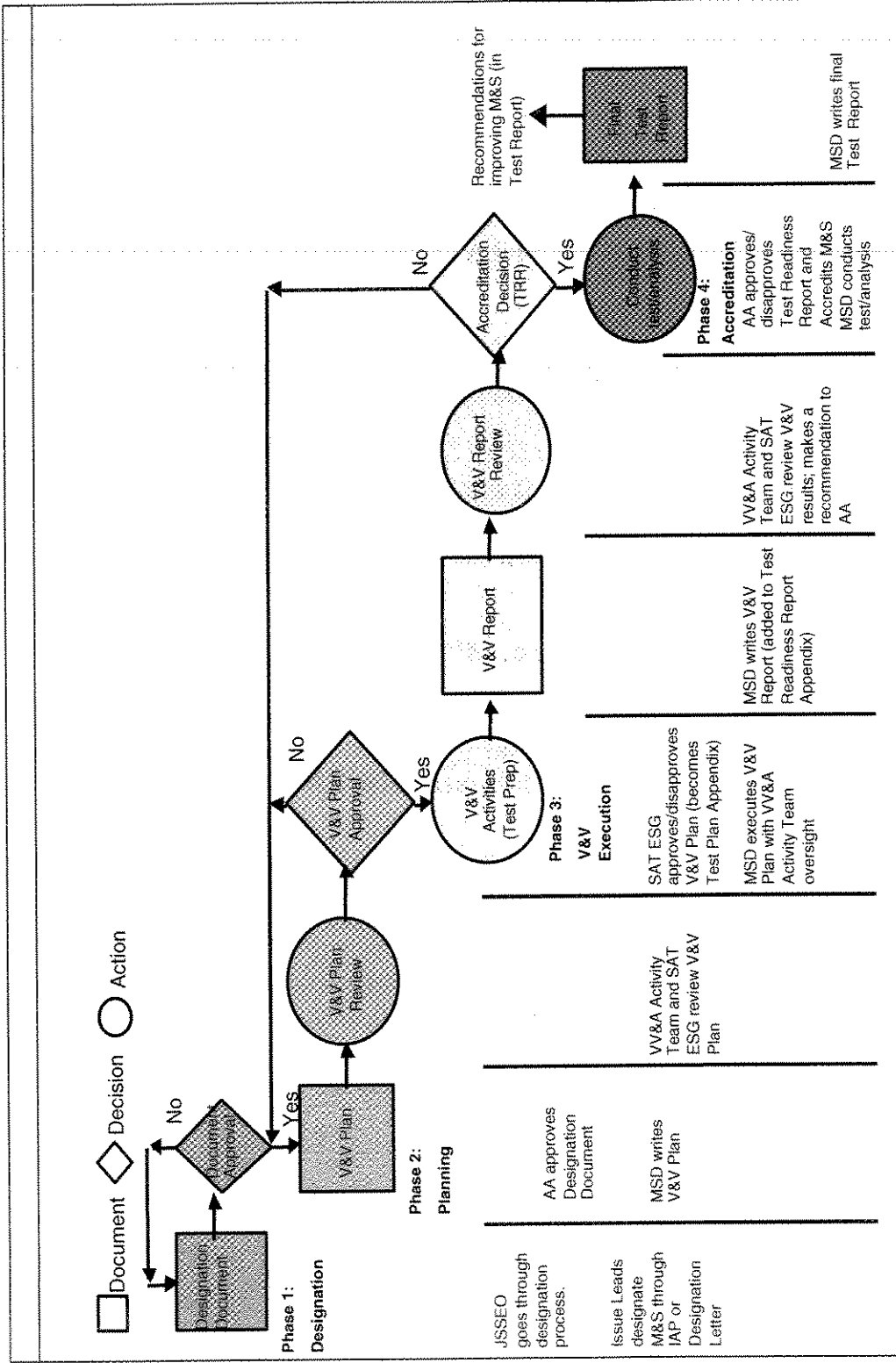


Figure 2. JSSEO VV&A Process

Tactical Office (TACO)

- Three-dimensional quick-look tool during test runs.
- Monitors and collects ECS, ICC, TADIL J, and DIS truth data.
- Post-mission 2D replay capability.

Performance Evaluation Tool (PET)

- Metrics evaluation tool developed by NSWC Corona.
- Incorporates ECS, ICC, TADIL J, and HLA truth data.
- Post-mission 2D replay capability.
- Seamless interoperability with ARCTIC.

Automatic Reconstruction and Correlation Tool for Interoperability Characterization (ARCTIC)

- Performs Automatic Truth to System track matching.
- Seamless interoperability with PET.
- Flexible/tailorable to all types of system data.

3.3 M&S Verification, Validation, and Accreditation (VV&A) Process

Verification, Validation, and Accreditation (VV&A) is required to determine that a simulation or federation of simulations is appropriate to use for a particular test objective. Models and simulations must be accredited for their intended use.

The test plan should include the V&V process diagram from the JSSEO Technical Report on M&S VV&A (TR 2003-006) shown in Figure 2 that discusses how JSSEO is charged with providing recommendations to decision authorities in the Office of Secretary of Defense (OSD) and Joint Staff on how to achieve SIAP-related requirements across all Services and Agencies. These recommendations must be reviewed by the affected Services and Agencies in order to achieve consensus on their implementation.

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The VV&A process includes development of a V&V plan for each of the federates and the overall federation itself. The purpose of the VV&A Plan is to describe how the test team applies the VV&A process and procedures to meet the VV&A needs. For each Federate or M&S, there will be a section dedicated to its specific V&V plan. All VV&A Plans shall reside in a V&V document separate from this Test Plan. This Test Plan, however, shall identify (Table 1) those federates requiring a V&V plan and the corresponding lead for each plan. Table 2 gives a schedule of the VV&A process for this test.

Table 1. Federates Requiring V&V Plan

Federate requiring V&V Plan	Responsible Party(ies)	
	Primary	Secondary
Overall Federation - Utility Player - PATRIOT Sim Interface - CRS-D - Tools (TIAC, JACE, CEES, TACO)	Primary Responsible Party	Secondary Responsible Party
Utility Player - GTE 1553 - DLS - TIAC/HLA	Primary Responsible Party	Secondary Responsible Party
PATRIOT Sim Inter. - GTE X.25 - FMS-D	Primary Responsible Party	Secondary Responsible Party
CRS-D - CRS	Primary Responsible Party	Secondary Responsible Party

Table 2. V&V Schedule

Date	Action
10 Mar 04	All V&V plans delivered to Maj. Borowsky
10-14 Mar 04	V&V Activity team* review of V&V plans. Borowsky provides approval of plans.
19 Mar 04	Status update in H. 100. Long preliminary V&V reports.
7 Apr 04	Telecon following dry run of V&V report. Maj. Borowsky provides recommendations to SAT ESG prior to TRR to accredit or not accredit.
9 Apr 04	Test Readiness Review and accreditation.

*V&V Action team: The VV&A Action Team is an ad hoc team of SMEs, Model/Tool developers/experts, Service representatives and other specialists. It will normally be established as part of the Test Plan Working Group. Provide team members and representatives from each organization and identify their associated organizations.

4. TEST SCHEDULE

Present the overall test schedule, in accordance with the project schedule, from event kickoff to delivery of the final report. Show the schedule of events in list or timeline format (Gantt chart, see Figure 3). Include any significant pre- and post-test requirements.

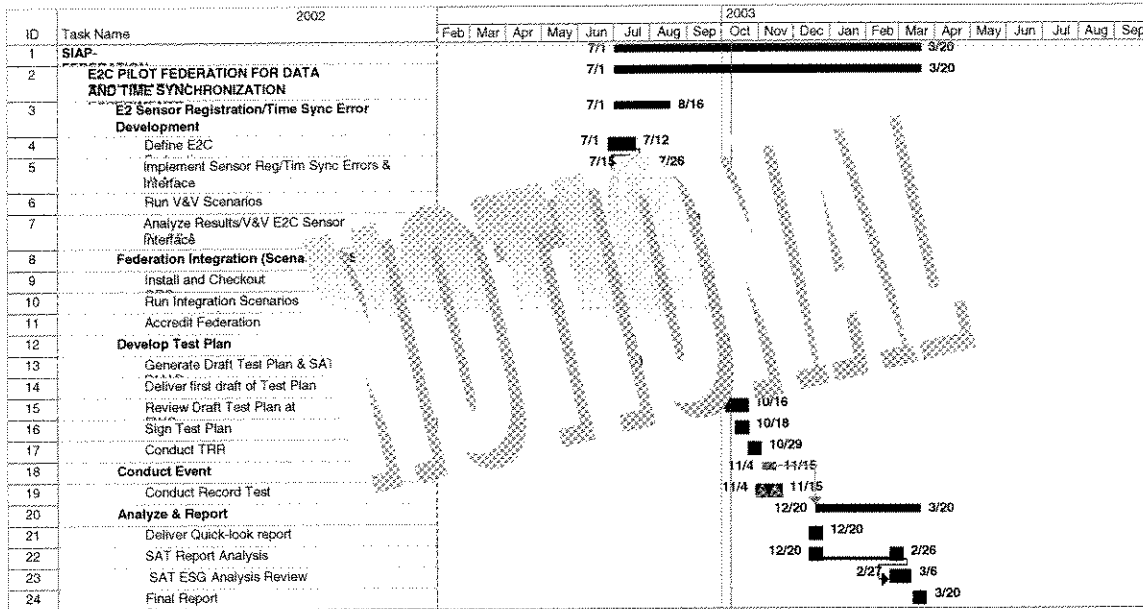


Figure 3. Notional Schedule

Because the Test Plan is written and approved well in advance of the Test Readiness Review, many of the tasks necessary to commence the test event will be incomplete when the Test Plan is approved. For those tasks to be completed after the Test Plan is approved, provide a closure plan in sufficient detail to be actionable, and identify by name the person responsible for completing the action.

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5. TEST MANAGEMENT AND ORGANIZATION

5.1 Roles and Responsibilities

Provide an organizational diagram for conducting the test. Figure 4 provides a notional organization of an event.

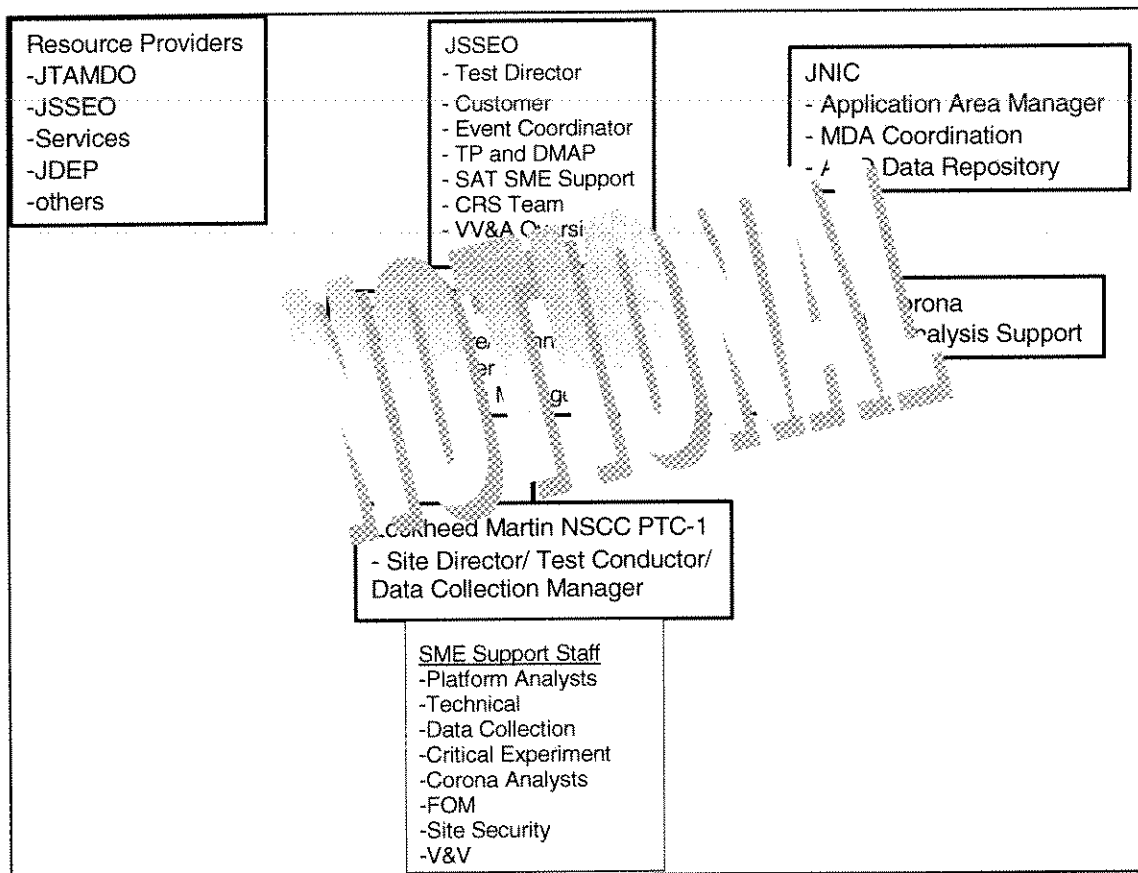


Figure 4. Notional Organization of an M&S Event

Discuss the specific roles and responsibilities for each organization. For each organization, identify key point(s) of contact, including contact information.

5.1.1 Customer (e.g., JSSEO)

The customer is the primary user of the test results.

The customer:

- Has primary responsibility for marshalling funding resources
- Describes the expected level of support for the event
- Provides some resources for the event

- Coordinates the event
- Oversees overall planning, conduct, and analysis of event
- Coordinates test plan development and data management and analysis plan
- Provides guidance on critical experiments via subject matter experts
- Develops the CRS excursion
- Provides the V&V process
- Has final accreditation authority for the event.

5.1.2 Test Sponsor Name (e.g., Joint Theater Air and Missile Defense Organization, JTAMDO)

The Test Sponsor is a resource provider and endorses the scope and goals of a project and represents the test throughout the management process. The Test Sponsor exercises approval authority over Test Objectives/Plans/Results.

5.1.3 Application Area Manager (e.g., Joint National Integration Center, JNIC) (M&S Venues)

The Application Area Manager provides technical environment support services, maintains visibility over a family of systems, and oversees test requirements.

The Application Area Manager:

- Reviews, evaluates test objectives, plans, analyses, and reports
- Participates in event planning, execution, data collection, and analysis
- Provides insight for other test activities and applications to the broader testing community

5.1.4 Infrastructure/Technical Manager (e.g., Joint Interoperability Test Command (JITC)) (M&S Venues)

The Infrastructure/Technical Manager is responsible for developing the federation.

The Infrastructure/Technical Manager:

- Develops and executes a V&V plan for the Utility Player.
- Is the Configuration Manager with the responsibility for ensuring that the FOM is configured properly and computer program versions used are documented
- Coordinates and maintains the Federation Agreements and coordinates FOM changes

- Will provide technical assistance, if requested, to issues involving HLA federate design or the RTI.

5.1.5 Participating Service(s) (e.g., Lower Tier Project Office/Software Engineering Directorate (LTPO/SED))

Identify the participating Service(s) for this event.

Participating Services will:

- Develop test procedures for conducting experiments
- Conduct V&V of their federate components in the test (M&S venues)
- Execute test runs
- Provide Subject Matter Experts to ensure test objectives are properly addressed
- Develop final technical reports of analysis and findings

5.1.6 Supporting Agencies (e.g., Naval Surface Warfare Center (NSWC) Corona)

Identify roles and responsibilities of Supporting Agencies.

Supporting Agencies:

- Ensure that the test(s) accurately capture program attributes
- Provide on-site analysis, as necessary.

5.1.7 SIAP Analysis Team (SAT): Executive Steering Group (ESG) and Other Test Representatives

Identify the SAT ESG members associated with the subject test and their intended roles and responsibilities. Include statements regarding whether the SAT ESG is expected to provide the resources necessary to plan, execute, and analyze an event.

It is the responsibility of SAT members to ensure the right tools are brought to collect necessary data and perform on-site analysis.

The SAT ESG also has a major role in the Verification, Validation and Accreditation Process, outlined in TR 2003-006 (M&S venues). It will be responsible for making a recommendation to accredit the federation.

5.1.8 SIAP Common Reference Scenarios (CRS) Team

Identify the CRS team that will be responsible for developing CRS excursions that reflect the needs of the event.

The SIAP CRS Team will:

- Develop the scenario with elements and formats consistent with the FOM
- Ensure the scenario contains the appropriate requisites to conduct experiments
- Provide data required to conduct test.

5.2 On-site Organization

Identify the on-site activity management personnel and their roles. Identify one overall leader and assistant managers (one for SIAP Analysis Team (SAT), one for critical experiments, and others as necessary for additional test areas).

Identify the SAT on-site objectives such as mission monitoring, events of interest investigating, and root-cause analysis activities. The SAT members should participate in the de-brief process and interact with operators whenever possible to address SIAP issues.

Identify the Test Observation Report (TOR) Manager. Discuss the TOR process that will be followed for capturing SIAP-related issues. This process should include adjudication practices to be used.

Provide a table that lists key on-site test execution and analysis personnel, their roles, the system or agency they represent, and their contact information. As appropriate, identify individuals who are providing analysis tools, and the associated logistics information.

6. REPORTING

6.1 Test Readiness Report

The Test Readiness Report updates the Test Plan and is presented to the designated approval authorities at the Test Readiness Review. The Test Readiness Report for an event follows the guidelines provided in the Standard Event Test Readiness Report Template, TR-2004-16. The purpose of the Test Readiness Review includes 1) a review of the test objectives, methods, data collection and analysis plan, individuals' roles and responsibilities, and Go/No-Go criteria, and 2) evidence to the approval authorities that all preparations for the test are complete and the test can be completed with a high likelihood of success. Approval signature on the Test Readiness Report indicates agreement with the report and authorization to conduct the test.

6.2 Quick-Look Report

Identify the organization(s) responsible for producing and/or reviewing the quick-look report(s). Quick-look reports shall be submitted to JSSEO within 30 calendar days of completing the test event. Following the test event, each organization submitting a quick-look report should report their preliminary findings as they relate to the test objectives. Any additional findings of significance, especially as they relate to the SIAP Attributes, should also be reported. Preliminary conclusions and recommendations as they relate to the test objectives should be included as appropriate.

6.3 Technical Report Development

Identify organization(s) responsible for producing and/or reviewing the final report. Set the timeline for submission. Establish the coordination process, through final approval authority. State expected format for the final report. For example: "A technical report will be generated within 90 days following completion of the E-2C JDEP event. Generating the report will be a collaborative effort. Final signature will be provided by JSSEO, JTAMDO, JNIC, JITC, and E-2C." Table 3 gives the planned schedule for the reporting process.

Table 3. Reporting Timeline Requirements

Description	Responsible Party(ies)	Date
Quick-look report		NLT 30 days after Test Event
Review of final results		NLT 45 days after Test Event
Review and comment		NLT 60 days after Test Event
Final Technical Report signed		NLT 90 days after Test Event

7. REFERENCES

List all relevant references to the document.

Theater Air and Missile Defense Capstone Requirements Document (TAMD CRD). (2001, March). U.S. Joint Forces Command.

Combat Identification Capstone Requirements Document (CID CRD), (2001) U.S. Joint Forces Command.

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SIAP Standard Data Management and Analysis Plan, Version 1.1, (2002, July). Arlington, VA: JSSEO.

SIAP Common Reference Scenario Technical Report, Version 1.1, (2002, July). Arlington, VA: JSSEO.

SIAP TF Technical Report 2003-006: Single Integrated Air Picture (SIAP) Verification, Validation, and Accreditation Guide for Models and Simulations. (2003, February). Arlington, VA: JSSEO.

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APPENDIX A: ACRONYMS

List all acronyms in the document. A standard set of frequently used acronyms is provided here and should be tailored for the event test plan.

AA	Accreditation Authority
ABT	Air-Breathing Threat
ACM/ACS	Automatic Channel Monitoring/Automatic Channel Select
AEW	Airborne Early Warning
AGC	Automatic Gain Control
ARCTIC	Automated Reconstruction and Correlation Tool for Interoperability Characterization
ASCII	American Standard Code For Information Interchange
CCD	Common Carrier Device
CD	Compact Disk
CEC	Cooperative Engagement Capability
CID	Combat Identification
CNA	Center for Naval Analyses
COTS	Commercial off the Shelf
CRD	Capstone Requirements Document
CRS	Common Reference Scenario
CRSD	Common Reference Scenario Driver
DCN	Document Control Number
DDM	Data Distribution Manager
DEP	Distributed Engineering Plant
DIS	Distributed Interactive Simulation
DISN	Defense Information Services Network
DM	Data Manager
DMAP	Data Management and Analysis Plan
DoDI	Department of Defense Instruction
DPCA	Displaced Phase Center Array
DPG	Defense Planning Guidance
DR	Data Recording/Data Reduction
DX	Data Extraction
ESC/AW	Electronic Systems Center (previously referred to as MASC)
ESG	Executive Steering Group
ESTEL	E-2C Systems Test and Evaluation Laboratory
FOM	Federation Object Model
FoS	Family of Systems
FTP	File Transfer Protocol

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GII	Group II
GIG	Global Information Grid
GPS	Global Positioning System
GRU	Gridlock Reference Unit
GTE	Gateway Terminal Emulator
HLA	High-Level Architecture
HWIL	Hardware in the Loop
IADS	Integrated Air Defense System
IAW	In Accordance With
ICC	Information and Coordination Central
ICD	Interface Control Document
ID	Identification
IFF	Identification Friend or Foe
JCoCaC	Joint Council of Captains and Colonels
JDEP	Joint Distributed Engineering Plant
JIADS	Joint Integrated Air Defense System
JITC	Joint Interoperability Test Command
JNIC	Joint National Integration Center
JSSEO	Joint SIAP System Engineering Organization
JTAMDO	Joint Air and Missile Defense Organization
JTIDS	Joint Tactical Information Distribution System
KPP	Key Performance Parameter
LTPO	Lower Tier Project Office
M&S	Modeling and Simulation
MDA	Missile Defense Agency
MIL-STD	Military Standard
MOE	Measure of Effectiveness
MOP	Measure of Performance
MS	Microsoft
MSD	Modeling and Simulation Developer
MULTOTS	Multiple Unit Link Test and Operations Training System
NAVAIR	Naval Air Systems Command
NI	NAVAIR Infrastructure
NSWC	Naval Surface Warfare Center
OSD	Office of the Secretary of Defense

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PC	Personal Computer
PET	Performance Evaluation Tool
PO	Program Office
POC	Point of Contact
PPLI	Precise Participant Location and Identification
PU	Participating Unit
R2	Reporting Responsibility
RISS	Radar IFF Simulation System
RTI	Runtime Infrastructure
SAT	Single Integrated Air Picture Analysis Team
SE	System Engineer
SED	Software Engineering Directorate
SIAP	Single Integrated Air Picture
SIF	Selective Identification Feature
Sim/Stim	Simulation/Stimulation
SIPRNet	Secret Internet Protocol Router Network
SME	Subject Matter Expert
SoS	System of Systems
SPC	Special Programs Center
SWIL	Software in the Loop
STU	Secure Telephone Unit
TACCAR	Time Averaged Clutter Coherent Airborne Radar
TADIL	Tactical Digital Information Link
TAMD	Theater Air and Missile Defense
TAMD CRD	Theater Air and Missile Defense Capstone Requirements Document
TD	Test Director or Tactical Driver
TDDS	TRAP Data Dissemination System
TF	Task Force
TIAC	Theater Air and Missile Defense Interoperability Assessment Capability
TIBS	Tactical Information Broadcast System
TIM	Terminal Input Message
TO	Test Objective
TOM	Terminal Output Message
TOR	Test Observation Report
TPWG	Test Plan Working Group
TQ	Track Quality
TRAP	Tactical Related Application
TSIU	Tactical System Interface Unit
VV&A	Verification, Validation, and Accreditation

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WAM	Warfare Assessment Model
WASP	Wrap-Around Simulator Processor
WG	Working Group
WST	Weapon Systems Trainer
2D	2 Dimensional
3D	3 Dimensional

APPENDIX B: SIAP METRICS

JSSEO developed a set of attributes (JSSEO Technical Report 2003-029) derived from TAMD and CID CRD key performance parameters. The test plan should describe in this appendix any information that impacts the calculation of the SIAP attributes and any measures of performance. All JSSEO tests should include a SIAP attributes calculation. Any caveats, limitations, or changes from the ordinary to compute them should be mentioned here. For reference, the qualitative definitions of the SIAP attributes are provided as follows:

Completeness: The measure of the portion of true air objects that are included in the SIAP. The air picture is complete when all objects are detected, tracked and reported.

Clarity: The measure of the portion of the SIAP that contains ambiguous tracks and/or spurious tracks. The air picture is clear when it does not include ambiguous or spurious tracks.

Continuity: The measure of how accurately the SIAP maintains track numbers over time. The air picture is continuous when the track number assigned to an object does not change.

Kinematic Accuracy: The measure of how accurately the TAMD Family of Systems (FoS) reports track position and velocity. The air picture is kinematically accurate when the position and velocity of each assigned track agree with the position and velocity of the associated object.

ID Completeness: The measure of the portion of tracked objects that are in an identified state. The ID is complete when all tracked objects are in an identified state.

ID Correctness: The measure of the portion of tracked objects that are in the correct ID state. The ID is correct when all tracked objects are in the correct ID state.

ID Clarity: The measure of the portion of tracked objects that are unambiguously identified. The ID is clear if no tracked object is in the ambiguous ID state.

Commonality: The measure of consistency of the air picture held by TAMD FoS participants. The air picture is common when the assigned tracks held by each participant have the same track number, position, and ID.

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The actual attribute computations will be automated through the use of the Performance Evaluation Tool (PET), into which the algorithms for the SIAP attributes have been encoded.

APPENDIX C: FEDERATION DEVELOPMENT PROCESS (M&S VENUES)

Federation Development and Execution Process (FEDEP)

The development of the federation designed to support this test follows the seven-step FEDEP process, which is now an IEEE standard process. This process provides the framework for the action plan and development schedule (Figure C-1). The steps in this process are shown in Figure C-1.

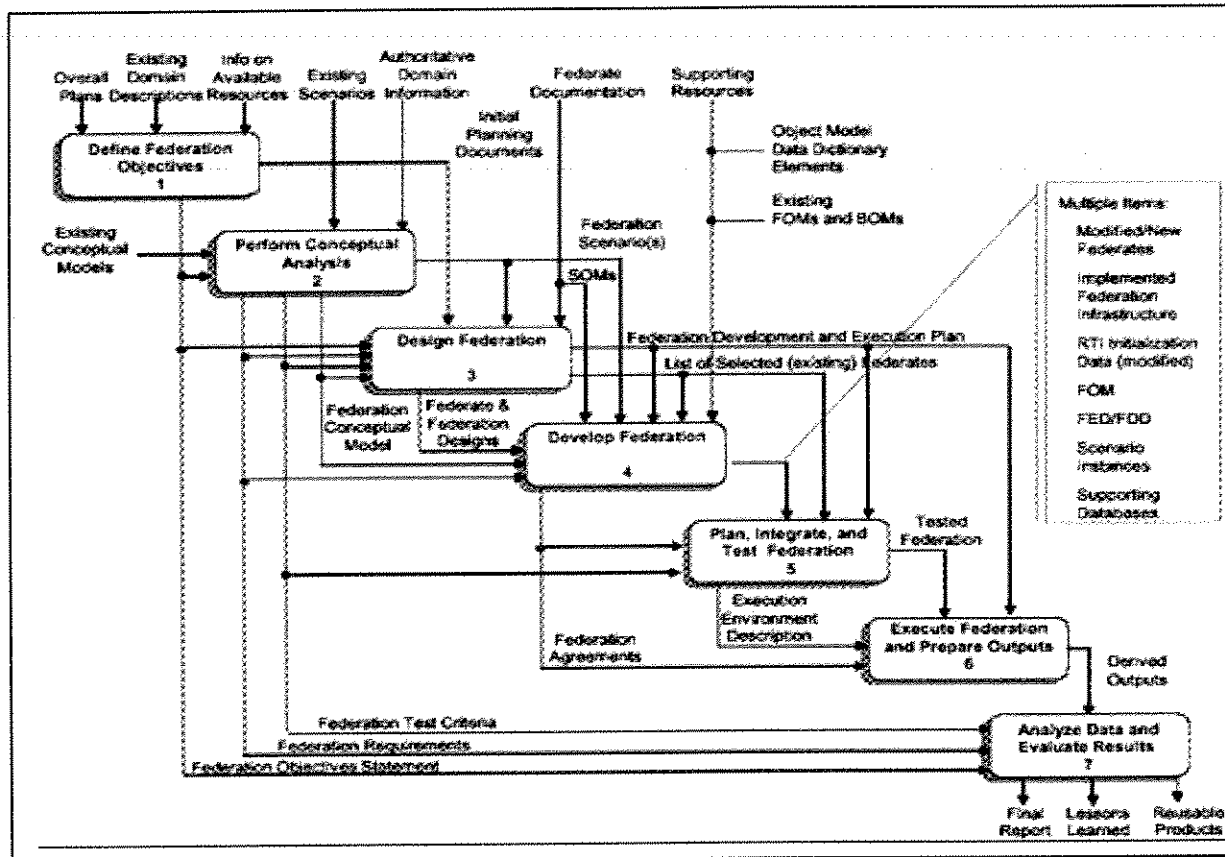


Figure C-1. Federation development and execution process

Step 1. Define Federation Objectives

The first step in this process is to clearly define the federation objectives. This is key because all subsequent steps build on the objectives. This federation is designed specifically to provide the environment to support the stated test objectives in time synchronization and data registration experimentation.

Step 2. Perform Conceptual Analysis

The next step is to define characteristics of federates and the federation needed to address issues. Of particular importance in this test is credibility of the scenario and its appropriateness as a context for the analysis (sufficient numbers and positions of friendly and enemy forces). Equally important are the characteristics of the sensor representation in terms of its ability to adequately represent the actual system, and the inputs needed from friendly forces (PPLI, IFF, remote tracks) to provide the environment needed for the test. These federation requirements drive the selection of federates and the VV&A of the federation. This step requires active participation of the subject matter experts and the system owners/proponents since it is dependent on a sound understanding of the problem area, the substantive issues to be addressed in the test, and requirements for selection of the representations to meet the needs of the test.

Step 3. Design Federation

The next step is to identify specific federates, develop the Federation Object Model (FOM) for the federation, define federation CONOPS, and delineate federate upgrades to support the federation. The federation design reflects the decision of how to satisfy the federation requirements with specific federates, scenarios and data exchanges. At this stage it is almost always necessary to return to steps 1 and 2. It may be necessary review the objectives for clarity and return to the conceptual analysis with more detail to ensure the requirements for the federation are well articulated and understood, the federation can be designed to meet the needs of the user.

Step 4. Develop Federation

Next, federate owners implement support for the FOM and enhancements in federates as needed and test individual federates.

Step 5. Plan, Integrate, and Test Federation

Incremental testing of federation capabilities and sets of federates is completed to prepare for the federation execution to support the test.

Step 6. Execute Federation and Prepare Outputs

The test is then conducted using the federation following the test process and procedures.

Step 7. Analyze Data and Evaluate Results

The final step is to conduct the data analysis, evaluate results, and produce the final report.

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APPENDIX D: POINTS OF CONTACT

Identify names of participants and their roles in the event. Provide contact information.

Table D-1. Participants in the JDEP Planning

Name	Organization	Phone	Email
Last name, First Name	Company, Office Symbol		

Table D-2. Test Directors/Site Test Directors

Site	TD / Site TD	Phone	Email
For example: "Test Director (Primary)"			
For example: "NAWC-AD (E2C)"			
For example: "Data Distribution Manager"			
For example: "Data Collection Manager"			

Table D-3. Data Collection Team

System	Location	Title/Organization	Name	Phone	Email
For example: "REPOSITORY"	For example: "NAVSEA Corona, CA"	For example: "DX Coordinator, NAVSEA Corona"			

Table D-4. Site Leads/POCs

Site	Primary / Alternate	Site POC	Phone	E-Mail
For example, "NAWC-AD (E-2C)"	Primary			
	Alternate			

Table D-5. Lead Analysts

System	POC	Phone	Email

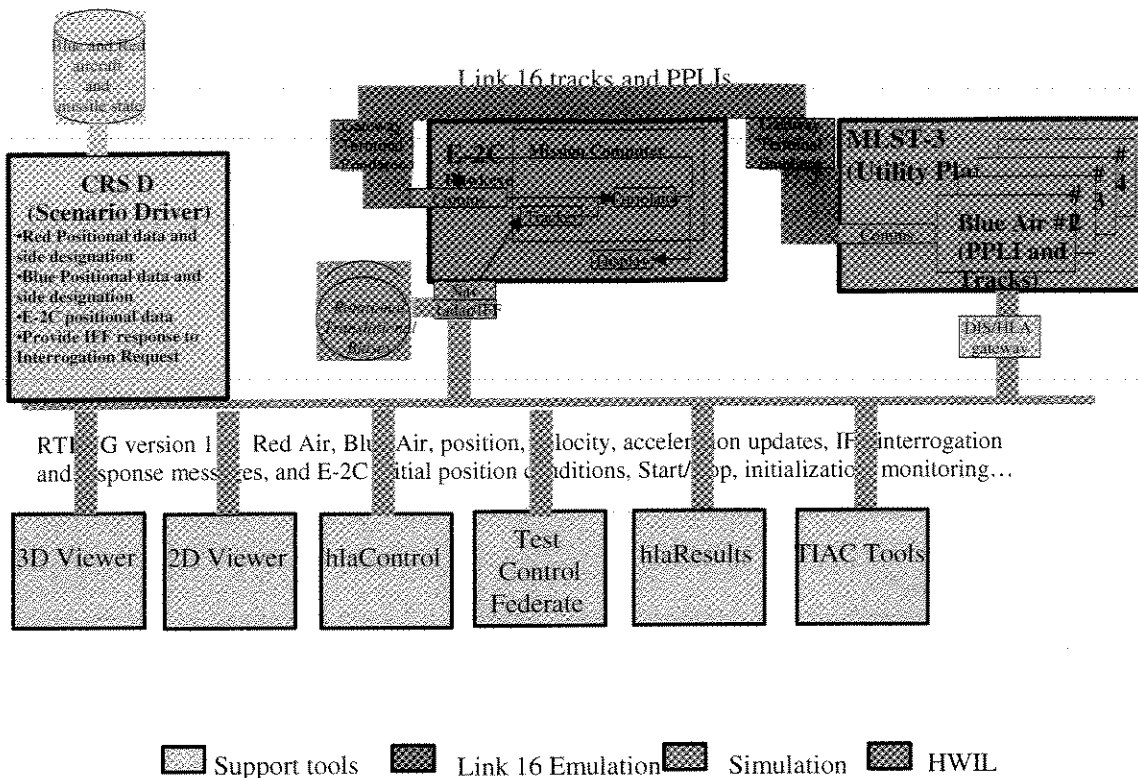


Figure 1: Sample JDEP Event Depiction

1.2.2 Environment

Describe the environment under which the test was conducted. Include weather and terrain factors encountered during the test, if applicable.

1.2.3 Air Defense Operations

Describe any air defense operations as conducted in the test.

1.2.4 Blue Forces (BLUFOR)

Describe any operations of the Blue Forces as conducted in the test.

1.2.5 Opposition Forces (OPFOR)

Describe any operations of the Opposition Forces as conducted in the test.

1 INTRODUCTION

The introduction should provide information that helps the reader understand why and under what conditions the test was conducted. Most of the information included in this section comes directly from the Test Readiness Report.

1.1 Purpose/Intent

State the purpose of the test. This section should indicate the importance of the subject to the reader and relate this report to previous and similar work.

1.2 Background

Reference should be made to previous related tests and analysis.

1.2.1 Location/Venue

Identify the location of the test. If the test was distributed, provide a figure showing the distributed location of the test participants and give an overall description of their geographic dispersal and the implications of their dispersal on the test outcome. See Figure 1 for a Joint Distributed Engineering Plant (JDEP) example.

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TABLE OF FIGURES

Figure 1: Sample JDEP Event Depiction 1-2

TABLE OF APPENDICES

APPENDIX A: ACRONYMS A-1
APPENDIX B: FORMAL ANALYSIS REPORTS (FARs) B-1
APPENDIX C: INSTRUMENTATION..... C-1
APPENDIX D: EXTENSIVE DATA D-1
APPENDIX E: MATHEMATICAL METHODSE-1
APPENDIX F: POINTS OF CONTACTF-1

TABLE OF CONTENTS

1	INTRODUCTION.....	1-1
1.1	Purpose/Intent	1-1
1.2	Background	1-1
1.2.1	Location/Venue	1-1
1.2.2	Environment.....	1-2
1.2.3	Air Defense Operations	1-2
1.2.4	Blue Forces (BLUFOR)	1-2
1.2.5	Opposition Forces (OPFOR).....	1-2
1.3	Overall Test Objectives.....	1-3
1.4	Assessment Constraints and Limitations.....	1-3
2	ASSESSMENT RESULTS AND ANALYSIS.....	2-1
2.1	General.....	2-1
2.2	Analysis Objectives	2-1
2.2.1	Objectives Description	2-1
2.3	Analysis Products	2-1
2.4	On-site Activity	2-1
2.4.1	On-Site Objectives	2-1
2.4.2	Organizational Analysis Support.....	2-2
2.4.3	Approach/Methodology.....	2-2
2.4.4	Data Collection	2-2
2.4.5	Test Procedures	2-2
2.4.6	Test Observation Report (TOR) Process	2-2
2.4.7	Data Availability Matrix	2-2
2.4.8	Results	2-2
2.5	Post-Event Analysis	2-3
2.5.1	Post-Event Objectives	2-3
2.5.2	Approach/Methodology.....	2-3
2.5.3	TSPI Discussion.....	2-3
2.5.4	Track Matching Process.....	2-3
2.5.5	PET Description and Processing.....	2-3
2.5.6	SIAP Attributes	2-3
2.5.7	Prioritized TORs and Events of Interest (EOIs).....	2-4
2.6	Critical Experiments	2-4
2.7	Additional Analytical Issues	2-4
3	LESSONS LEARNED	3-1
3.1	Pre-Event Lessons Learned	3-1
3.2	On-Site Lessons Learned.....	3-1
3.3	Post-Event Lessons Learned.....	3-1
4	CONCLUSIONS AND RECOMMENDATIONS	4-1
4.1	Unresolved Issues	4-1
5	REFERENCES.....	5-1

EXECUTIVE SUMMARY

The executive summary is designed to present a quick synopsis of the report's contents. Limit the executive summary to one page, if possible. Discuss only the most important results and findings using the following outline:

EVENT OVERVIEW

Provide a summary of essential information regarding the testing/simulation event. Include high-level objectives, dates, location of the event, and how the information will be used.

BACKGROUND

Identify any background information relevant to the test and its objectives.

SUMMARY OF EFFORT

Provide a summary of the test, including the on-site and post-event analysis effort.

LESSONS LEARNED

Include key lessons learned from the event.

CONCLUSIONS AND RECOMMENDATIONS

List the conclusions reached and any recommendations.

1.3 Overall Test Objectives

State the objectives of the test, which should be verbatim from the Test Readiness Report. If any objectives were not accomplished, identify them and explain why they were not accomplished. After you have stated which objectives were not accomplished and the reasons, then these objectives need not be mentioned again.

1.4 Assessment Constraints and Limitations

Include items that were not known or anticipated at the time of test planning, such as not being provided with anticipated equipment or computer programs, or changes in overall program schedule or scope.

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2 ASSESSMENT RESULTS AND ANALYSIS

This section is the core of the technical report. Include sufficient detail to clarify what was done and what was learned; be thorough, yet concise. Avoid excessive use of acronyms. If a new technique, procedure, or data gathering concept was developed, mention it here, but describe it thoroughly in an appendix. All conclusions and recommendations will depend upon this section for substantiation. Summary figures and tables that support major conclusions are appropriate in this section.

2.1 General

All achieved objectives contained in Section 1 should be covered. Specify the criteria against which the data supporting an objective were evaluated.

2.2 Analysis Objectives

Enumerate and list a title for each objective.

2.2.1 Objectives Description

Include a brief statement of each test objective.

2.3 Analysis Products

List the specific products expected to come out of the test analysis.

2.4 On-site Activity

Include a description of the methods employed to accomplish each objective while on site during the test. The length of this presentation will vary, depending on the objectives to be accomplished.

2.4.1 On-Site Objectives

Identify the objectives of the on-site analysis (e.g., root-cause analysis, events of interest, and Test Observation Report (TOR) capture and adjudication).

2.4.2 Organizational Analysis Support

Identify the roles and responsibilities of the organizations who participated in the test. List each organization separately, and indicate the contribution provided to the test (e.g., data collect, data reduction, data analysis).

2.4.3 Approach/Methodology

Describe the on-site analysis approach/methodology conducted during the test.

2.4.4 Data Collection

This section contains a description of tools used to collect data for analysis for each system involved. The tools should be described in sufficient detail to enable understanding of test procedures used and results obtained.

2.4.5 Test Procedures

Describe the test procedures for conducting the on-site analysis. Describe who did what during the on-site activity.

2.4.6 Test Observation Report (TOR) Process

Describe the process by which test observations were captured in TORs. Discuss the on-site adjudication of the TORs. Include whether an on-site version of the Lessons Learned Knowledge Base (LLKB) was used and to what extent.

2.4.7 Data Availability Matrix

Provide a data availability matrix for each participating system for each day of the event. Describe the data source, a brief description of the data (e.g., E-2C track file), and availability of the data for each day. For times where data was not available, provide a concise explanation.

2.4.8 Results

Summarize the findings and results of the on-site analysis. Identify any limitations or other issues that occurred during the on-site analysis process.

2.5 Post-Event Analysis

This section discusses the post-event analysis effort. It discusses the methodology, how truth data is developed, SIAP attribute calculations, Test Observation Reports (TORS) and their dissemination, events of interest, and critical experiments.

2.5.1 Post-Event Objectives

Identify the objectives of the post-event analysis. Include any dependence of the post-event analysis on the findings of the on-site analysis.

2.5.2 Approach/Methodology

Describe the approach/methodology of the post-event analysis.

2.5.3 TSPI Discussion

Discuss how the truth data was reduced and used in the post-event analysis.

2.5.4 Track Matching Process

Describe the track-matching process that was used for the post-event analysis. Indicate whether the Automated Reconstruction and Correlation Tool for Interoperability Characterization (ARCTIC) will be used (and include the version number of that computer program) and whether manual efforts will be conducted and to what extent.

2.5.5 PET Description and Processing

Indicate the version of Performance Evaluation Tool (PET) used for analysis and indicate whether the PET format provided in the test readiness report for the event was used or if a modified version was used. If a new format was used, indicate where differences lie, or provide a new table in an appendix.

2.5.6 SIAP Attributes

In this section, provide the results of the SIAP attributes calculations. Provide discussion and any root-cause analysis available of those results that do not meet objective and threshold values.

2.5.7 Prioritized TORs and Events of Interest (EOIs)

Each system involved in the test should provide a prioritized list of issues captured in TORs that were addressed post-event. Identify the events of interest analyzed post-event.

2.6 Critical Experiments

For each critical experiment, use a subsection to provide a brief overview of the experiment conducted for this test. Refer to the Test Readiness Report if necessary. Discuss the success or failure of meeting the critical experiment data collection requirements and other objectives. Provide the analysis and reporting plan for each critical experiment. Alternatively, each critical experiment description may be put into its own separate appendix to the final report.

2.7 Additional Analytical Issues

Use this section to identify any additional considerations about the analysis conducted post-event.

3 LESSONS LEARNED

This section should summarize the lessons learned from the event. Identify any problems encountered during the test and provide a brief discussion. Define and identify the solution to any issues that could benefit other comparable tests in the future.

3.1 Pre-Event Lessons Learned

Identify lessons learned from the event, including issues from a logistics and planning perspective. Include elements that worked well and those that need improvement.

3.2 On-Site Lessons Learned

Identify lessons learned from the on-site activities, including issues from an execution, and on-site analysis process perspective, including data collected, tools used, and methodologies exercised. Include elements that worked well and those that need improvement.

3.3 Post-Event Lessons Learned

Identify lessons learned from the post-event activities, including issues from the analysis process perspective, including reconstruction tools used, and methodologies exercised. Include elements that worked well and those that need improvement. Indicate how and by whom relevant TORs will be reviewed for candidacy into the SIAP Lessons Learned Knowledge Base.

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4 CONCLUSIONS AND RECOMMENDATIONS

This section should be able to stand alone. Include a summary paragraph briefly describing the key accomplishments and the extent to which the test objectives were met. Provide a summary discussion of the venue and its appropriateness for addressing the test objectives.

List interpretations of the results found in Section 2. These conclusions should be drawn from analysis and qualitative consensus.

Provide recommendations that identify what (if anything) should be done about the conclusions.

4.1 Unresolved Issues

Identify issues that have yet to be decided. Note any unresolved issues relating to the schedule, scope, or quality of the test effort.

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5 REFERENCES

References, when used, are always cited. Reports, books, papers, and other publications referred to in the report should be listed. Include any citations of work related to points brought out in the report or given as sources of additional information for the reader. References should include bibliographical information (i.e., complete title, author, publisher, date, etc.).

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APPENDIX A: ACRONYMS

Any abbreviation, symbol, and acronym used in your report must be defined in the report, when first used, and on this page. SIAP-related common acronyms are provided here.

A	Ambiguity
ABT	Air-Breathing Threat
AEW	Airborne Early Warning
AGC	Automatic Gain Control
ARCTIC	Automated Reconstruction and Correlation Tool for Interoperability Characterization
ASCII	American Standard Code For Information Exchange
C	Completeness (SIAP attribute)
CCD	Common Carrier Device
CD	Compact Disk
CEC	Cooperative Engagement Capability
CID CRD	Combat Identification Capstone Requirements Document
CINC	Commander in Chief
CNA	Center for Naval Analyses
COTS	Commercial off the Shelf
CRD	Capstone Requirements Document
CRS	Common Reference Scenario
CRSD	Common Reference Scenario Driver
DDM	Data Distribution Manager
DIS	Distributed Interactive Simulation
DISN	Defense Information Services Network
DM	Data Manager
DMAP	Data Management and Analysis Plan
DPCA	Displaced Phase Center Array
DPG	Defense Planning Guidance
DR	Data Recording/Data Reduction
DX	Data Extraction
DX/DR	Data Extraction/Data Recording
EOI	Event of Interest
ESG	Executive Steering Group
ESTEL	E-2C Systems Test and Evaluation Laboratory
FAR	Formal Analysis Report
FOM	Federation Object Model
FTP	File Transfer Protocol

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GPS	Global Positioning System
GRU	Gridlock Reference Unit
GTE	Gateway Terminal Emulator
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HWIL	Hardware in the Loop
IADS	Integrated Air Defense System
IAW	In Accordance With
ICC	Information and Coordination Central
ICD	Interface Control Document
ID	Identification
IFF	Identification Friend or Foe
JCoCaC	Joint Council of Colonels and Captains
JDEP	Joint Distributed Engineering Plant
JIADS	Joint Integrated Air Defense System
JITC	Joint Interoperability Test Command
JNIC	Joint National Interoperability Center
JTAMDO	Joint Air and Missile Defense Organization
JTIDS	Joint Tactical Information Distribution System
KPP	Key Performance Parameter
MDA	Missile Defense Association
MIL-STD	Military Standard
MOE	Measure of Effectiveness
MOP	Measure of Performance
MS	Microsoft
NAVAIR	Navy Air
NSWC	Naval Surface Warfare Center
PC	Personal Computer
PET	Performance Evaluation Tool
PO	Program Office
POC	Point of Contact
PPLI	Precise Participant Location and Identification
PU	Participating Unit
R2	Reporting Responsibility
RTI	Runtime Infrastructure
SAT	Single Integrated Air Picture Analysis Team

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SE	System Engineer
SIAP	Single Integrated Air Picture
SIF	Selective Identification Feature
Sim/Stim	Simulation/Stimulation
SIPRNET	Secret Internet Protocol Router Network
SME	Subject Matter Expert
SoS	System of Systems
SPC	Special Programs Center
SWIL	Software in the Loop
STU	Secure Telephone Unit
TACCAR	Time Averaged Clutter Coherent Airborne Radar
TADIL	Tactical Digital Information Link
TAMD	Theater Air and Missile Defense
TAMD CRD	Theater Air and Missile Defense Capstone Requirements Document
TD	Test Director or Tactical Driver
TDDS	TRAP Data Dissemination System
TF	Task Force
TIAC	Theater Air and Missile Defense Interoperability Assessment Capability
TIBS	Tactical Information Broadcast System
TIM	Terminal Input Message
TO	Test Objective
TOM	Terminal Output Message
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TPWG	Test Plan Working Group
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TRAP	Tactical Related Applications
TSIU	Tactical System Interface Unit
VV&A	Verification, Validations, and Accreditation
WAM	Warfare Assessment Model
WASP	Wrap-around Simulator Processor
WG	Working Group
WST	Weapons Systems Trainer
2D	2 Dimensional
3D	3 Dimensional

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APPENDIX B: FORMAL ANALYSIS REPORTS (FARs)

In this section, list any formal analysis reports. These reports should include detailed discussion of the problem observed, the cause of the problem, and either a solution to the problem or a disposition for addressing the problem.

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APPENDIX C: INSTRUMENTATION

This appendix contains a more detailed description of the equipment used to gather data. The instrumentation is described in sufficient detail to enable understanding of test procedures used and results obtained.

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APPENDIX D: EXTENSIVE DATA

Use this section to provide data to substantiate the findings of the analysis. Use table format whenever possible to organize data in a consistent manner. This section should also include data formats used.

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APPENDIX E: MATHEMATICAL METHODS

Identify any structural analysis, statistical studies, or any analyses that were used to set up or perform the test or to reduce and analyze the results. Provide detailed results and calculations.

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APPENDIX F: POINTS OF CONTACT

Provide, in tabular format, a listing of contact information for personnel who contributed to the planning, execution, and analysis in this report.

